

WHAT IS CLAIMED IS:

- 1 1. An integrated circuit comprising:
2 a plurality of serializer/deserializers (SERDESs);
3 core processing logic integrated with each said SERDES and
4 connected to each said SERDES to exchange signals therewith; and
5 a plurality of testers integrated with said plurality of SERDESs
6 and said core processing logic, said testers being connected to individually
7 test each said SERDES, said testers being enabled to detect performance
8 characteristics of individual said SERDESs.
- 1 2. The integrated circuit of claim 1 further comprising a semiconductor
2 substrate on which said SERDESs, said core processing logic and said
3 testers are fabricated.
- 1 3. The integrated circuit of claim 1 wherein each said tester includes a test
2 controller and a test interface, each said tester being dedicated to a specific
3 said SERDES, said test interface of each said tester being coupled between
4 said core processing logic and said SERDES to which said each tester is
5 dedicated, said tester controller being configured to select among a normal
6 operation mode and a plurality of test modes for operation of said test inter-
7 face.
- 1 4. The integrated circuit of claim 3 wherein each said test interface includes
2 a test pattern generator that is connected to inputs of parallel data of said
3 SERDES to which said test interface is dedicated, said test interface further
4 including an error detector connected to outputs of parallel data from said
5 SERDES.
- 1 5. The integrated circuit of claim 1 wherein each said tester is connected to a
2 common test bus that is integrated with said SERDESs and said testers, each
3 said tester having a unique address that enables independent accessibility of
4 said tester via said test bus.

1 6. The integrated circuit of claim 5 further comprising an input/output tester
2 controller integrated with said SERDESs and said testers, said input/output
3 tester controller being coupled between said test bus and an output of said
4 integrated circuit for signal communication with an external source for
5 sequencing test operations.

1 7. The integrated circuit of claim 5 further comprising a built-in-self-test
2 (BIST) state machine integrated with said SERDESs and said testers, said
3 BIST being connected to said test bus and being configured to sequence test
4 operations by said individual said testers.

1 8. The integrated circuit of claim 1 wherein said testers are responsive to
2 individual commands and are configured to be individually but concurrently
3 operated, said testers having a one-to-one correspondence with said
4 SERDESs.

1 9. An integrated circuit comprising:
2 a substrate;
3 core circuitry integrated onto said substrate;
4 a plurality of SERDESs integrated onto said substrate, each
5 said SERDES having parallel data inputs and parallel data outputs and
6 having serial data inputs and outputs;
7 a plurality of functional test interfaces (FTIs) integrally formed
8 with said substrate, each said FTI being uniquely associated with one of said
9 SERDESs and being connected to said parallel data inputs and outputs of
10 said associated SERDES, said FTIs being enabled to individually and
11 concurrently test performances of said SERDESs;
12 a plurality of functional test controllers (FTCs) integrally formed
13 with said substrate, each said FTC being uniquely associated with one of
14 said FTIs and being configured to select among operational modes of said
15 associated FTI; and
16 an input/output controller (IOC) integrally formed with said
17 substrate, said IOC being connected to each said FTC to transmit individually
18 addressed commands to each said FTC, said IOC further being connected to
19 exchange signals with an external device.

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1 10. The integrated circuit of claim 9 wherein each said FTI is configured to
2 operate in a plurality of alternative said operational modes, including a
3 normal-operation mode in which data is transmitted between said core
4 circuitry and said associated SERDES via said FTI.

1 11. The integrated circuit of claim 9 wherein each said FTI includes a pattern
2 generator connected to said parallel data inputs of said associated SERDES
3 and includes an error detector connected to said parallel data outputs of said
4 associated SERDES.

1 12. The integrated circuit of claim 9 further comprising a built-in-self-tester
2 (BIST) integrally formed on said substrate, said BIST being connected and
3 configured to activate testing via said FTIs.

1 13. The integrated circuit of claim 9 wherein each of said FTIs is connected
2 to said IOC via a common test bus, said FTIs also being connected to said
3 core circuitry.

1 14. The integrated circuit of claim 13 wherein each said FTI is assigned a
2 unique address, said IOC being enabled to individually manipulate said FTIs
3 by employing said unique addresses.

1 15. A method of testing operations of serializer/deserializers (SERDESs) of
2 an integrated circuit comprising the steps of:
3 embedding a plurality of test interfaces within said integrated
4 circuit such that each test interface is specific to one said SERDES with
5 respect to exchanging parallel data;
6 embedding test controllers within said integrated circuit such
7 that each said test controller is specific to one said test interface with respect
8 to triggering test operations by said test interface; and
9 providing an integrated circuit output that enables said test
10 controllers to be individually addressed.

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1 16. The method of claim 15 further comprising the step of embedding an
2 input/output controller (IOC) and a test bus within said integrated circuit,
3 including connecting said IOC between said integrated circuit output and said
4 test bus and including linking each said test controller to said test bus.

1 17. The method of claim 15 further comprising a step of concurrently
2 enabling all of said test interfaces to simultaneously monitor performances
3 of said SERDESSs.

1 18. The method of claim 15 further comprising the step of embedding a
2 built-in-self-test (BIST) state machine within said integrated circuit such that
3 said BIST is connected to each said test controller.

1 19. The method of claim 15 further comprising the step of forming an
2 insulative package to house circuitry of said integrated circuit.

1 20. The method of claim 15 wherein said embedding of said test interfaces
2 includes fabricating each said test interface to include a test pattern generator
3 connected to parallel data inputs of said SERDES to which said test interface
4 is specific and further includes fabricating said test interfaces to include error
5 detectors to receive parallel data from said SERDESSs.

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